

CLMPTO

11/16/04

CLAIMS 1-84 (CANCELLED)

85. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

patterning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming a gate electrode over the gate insulating film;

forming an insulating film over the gate insulating film; and

forming a wiring over the insulating film,

wherein the wiring is connected to the selected portion in contact with said first region of the active layer.

86. (Previously Presented) A method according to claim 85, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

87. (Previously Presented) A method according to claim 85, wherein the heating is performed at a temperature of 450 to 500 °C.

88. (Previously Presented) A method according to claim 85, wherein the crystallization promoting material is disposed by a spin-coating.

89. (Previously Presented) A method according to claim 85, wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{15} atoms/cm³ or more.

90. (Previously Presented) A method according to claim 85, wherein the semiconductor device constitute a driver circuit of an active matrix display device.

Art Unit: 2878

91. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

patterning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming two gate electrodes over the gate insulating film;

forming an insulating film over the gate insulating film; and

forming a wiring over the insulating film,

wherein the wiring is connected to the selected portion in contact with said first region of the active layer.

wherein the active layer constitutes a pair of N-channel and P-channel thin film transistors.

92. (Previously Presented) A method according to claim 91, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

93. (Previously Presented) A method according to claim 91, wherein the

heating is performed at a temperature of 450 to 500 °C.

94. (Previously Presented) A method according to claim 91, wherein the crystallization promoting material is disposed by a spin-coating.

95. (Previously Presented) A method according to claim 91, wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{15} atoms/cm³ or more.

96. (Previously Presented) A method according to claim 91, wherein the semiconductor device constitute a driver circuit of an active matrix display device.

97. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

patternning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming a gate electrode over the gate insulating film;

forming an insulating film over the gate insulating film; and
forming a wiring over the insulating film,
wherein the wiring is connected to the selected portion of the active layer in
contact with said first region of the active layer.

98. (Previously Presented) A method according to claim 97, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

99. (Previously Presented) A method according to claim 97, wherein the heating is performed at a temperature of 450 to 500 °C.

100. (Previously Presented) A method according to claim 97, wherein the crystallization promoting material is disposed by a spin-coating.

101. (Previously Presented) A method according to claim 97, wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{15} atoms/cm³ or more.

102. (Previously Presented) A method according to claim 97, wherein the semiconductor device constitute a driver circuit of an active matrix display device.

103. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:
forming a semiconductor film over a substrate;
disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

Art Unit: 2878

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

patterning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming a gate electrode over the gate insulating film;

forming an insulating film over the gate insulating film; and

forming a wiring over the insulating film,

wherein the wiring is connected to the selected portion of the active layer in contact with said first region of the active layer.

wherein the crystals extend along with a direction in which carriers of the thin film transistor flow.

104. (Previously Presented) A method according to claim 103, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

105. (Previously Presented) A method according to claim 103, wherein the heating is performed at a temperature of 450 to 500 °C.

106. (Previously Presented) A method according to claim 103, wherein the crystallization promoting material is disposed by a spin-coating.

Art Unit: 2878

107. (Previously Presented) A method according to claim 103, wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{15} atoms/cm³ or more.

108. (Previously Presented) A method according to claim 103, wherein the semiconductor device constitute a driver circuit of an active matrix display device.

109. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

patternning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming a gate electrode over the gate insulating film;

forming an insulating film over the gate insulating film; and

forming a wiring over the insulating film,

wherein the wiring is connected to the selected portion in contact with said first region of the active layer.

wherein the crystals extend along with a direction connecting source and drain regions of the thin film transistor.

Art Unit: 2878

110. (Previously Presented) A method according to claim 109, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

111. (Previously Presented) A method according to claim 109, wherein the heating is performed at a temperature of 450 to 500 °C.

112. (Previously Presented) A method according to claim 109, wherein the crystallization promoting material is disposed by a spin-coating.

113. (Previously Presented) A method according to claim 109, wherein the active layer contains the crystallization promoting material at a concentration of 1 x 10¹⁵ atoms/cm³ or more.

114. (Previously Presented) A method according to claim 109, wherein the semiconductor device constitute a driver circuit of an active matrix display device.

115. (Currently Amended) A method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

disposing a crystallizing promoting material in contact with a selected portion of the semiconductor film;

crystallizing the semiconductor film by heating wherein a crystal grows from said selected portion of the semiconductor film to a second portion of the semiconductor film adjacent to said selected portion;

Art Unit: 2878

patterning the crystalline crystallized semiconductor film to form an active layer including the selected portion wherein said active layer includes at least a first region and a second region where said first region includes at least a part of the selected portion of the semiconductor film and said second region includes at least a part of the second portion of the semiconductor film;

forming a gate insulating film over the active layer;

forming a gate electrode over the gate insulating film;

forming an insulating film over the gate insulating film; and

forming a wiring over the insulating film,

wherein the wiring is connected to the selected portion in contact with said first region of the active layer.

wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{19} atoms/cm³ or less.

116. (Previously Presented) A method according to claim 115, wherein the crystallization promoting material comprises an element selected from the group consisting of Ni, Fe, Co, Pd and Pt.

117. (Previously Presented) A method according to claim 115, wherein the heating is performed at a temperature of 450 to 500 °C.

118. (Previously Presented) A method according to claim 115, wherein the crystallization promoting material is disposed by a spin-coating.

119. (Previously Presented) A method according to claim 115, wherein the active layer contains the crystallization promoting material at a concentration of 1×10^{18} atoms/cm³ or more.

120. (Previously Presented) A method according to claim 115, wherein the semiconductor device constitute a driver circuit of an active matrix display device.